

IN THE CLAIMS:

1. to 12. (Canceled)

13. (New) An information recording medium comprising:

a pair of electrodes;

a liquid crystal material filled into a gap between said electrodes, the liquid crystal material comprising a rod-shape liquid crystal compound,

said liquid crystal material having a property such that charge-transport properties are varied according to a phase transfer between a plurality of stable liquid crystal phases of the liquid crystal and/or a history of the phase transfer, the phase transfer of the liquid crystal material occurring upon a change in temperature of the liquid crystal material between a crystalline phase at a room temperature to an isotropic phase in a final state through a smectic phase at an elevated temperature,

said liquid crystal material comprising a material selected from the group consisting of a phenylbenzothiazole liquid crystal, 4-hexyloxy-4-butanoylbiphenyl, and a phenylnaphthalene

liquid crystal wherein the phenylnaphthalene is one selected from the group consisting of 2-(4'-octylphenyl)-6-dodecyloxynaphthalene, 2-(4'-octylphenyl)-6-butyloxynaphthalene, 2-(4'-octylphenyl)-6-nonyloxynaphthalene and a mixture thereof,

a thickness of the gap between the electrodes being larger than a domain size of the liquid crystal compound at least in the initial state of the liquid crystal material, and

the thickness of the gap between the electrodes being smaller than a domain size of the liquid crystal compound in a cooled state from the isotropic phase in a final state.

14. (New) The information recording medium according to claim 13, wherein the information is recorded by applying thermal energy.

15. (New) The information recording medium according to claim 13, wherein the information is read by measuring the value of a photoelectric current generated by light applied to an information recorded portion.

16. (New) The information recording medium according to claim 13, wherein at least one of the pair of electrodes is transparent to light.

17. (New) The information recording medium according to claim 13, wherein a thermal head or a laser beam is used as means for applying thermal energy for information recording.

18. (New) The information recording medium according to claim 13, wherein the phenylbenzothiazole liquid crystal material is 2-(4'-heptyloxyphenyl)-6-dodecylthiobenzothiazole.

19. (New) The information recording medium according to claim 13, wherein

the liquid crystal material comprises a liquid crystalline charge-transport material,

a background for information recording is in a state that the charge-transport properties are inhibited attributable to polycrystalline structural defects in the initial state of the liquid crystal charge-transport material, and

information recording is carried out by phase transfer caused in the background upon the application of thermal energy.

20. (New) The information recording medium according to claim 13, wherein two or more charge-transport properties can be developed in a specific liquid crystal phase according to the level of the thermal energy applied.

21. (New) The information recording medium according to claim 13, wherein the pair of electrodes is provided on a substrate.

22. (New) The information recording medium according to claim 13, wherein the thickness between the pair of electrodes satisfies both requirements represented by inequalities (A) and (B):

(A) (Permeation depth at excitation light wavelength of liquid crystal material) < (Thickness between pair of electrodes)

(B) (Thickness between pair of electrodes) < (Thickness which can exhibit field strength such as to enable reading of photoelectric current).

23. (New) A device comprising:

a pair of electrodes;

a liquid crystal material filled into a gap between said electrodes, the liquid crystal material comprising a rod-shape liquid crystal compound,

said liquid crystal material having a property such that charge-transport properties are varied according to a phase transfer between a plurality of stable liquid crystal phases of the liquid crystal and/or a history of the phase transfer, the phase transfer of the liquid crystal material occurring upon a change in temperature of the liquid crystal material between a crystalline phase at a room temperature to an isotropic phase in a final state through a smectic phase at an elevated temperature, and

a thickness of the gap between the electrodes being smaller than a domain size of the liquid crystal compound in a cooled state from the isotropic phase in a final state.